

CHARTS  
FLOW PLAYS

PAINT NUMBERED  
TREES

PERMANENT  
SAMPLES

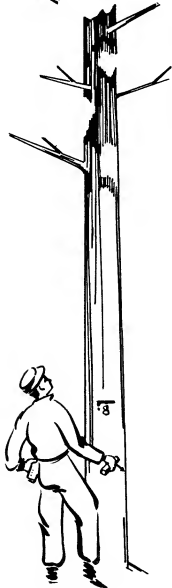
TIMBER  
BOOKKEEPING

UNIT  
RECORDS

THE DIAMETER  
TAPE

TRIAL  
BALANCE

PORT-A-  
PUNCH



# FOREST CONTROL

## by CONTINUOUS INVENTORY

"Today I have grown taller from walking  
with the trees."

...Karle Wilson

Upper Darby, Pa. December 1967 #151

Although the CFI newsletter has been conspicuous by its absence for a few months, continuous forest inventory has not taken such a vacation. There have been many remeasurements and a number of new starts. Now that foresters have become more acquainted with computers and computer personnel with foresters, the process of calculating measurements and remeasurements is becoming a much smoother operation. No longer is it necessary to have a CFI specialist from the Forest Service on every job to tie the foresters to the computers. Recently a number of cases have been handled by company foresters and their computer staffs without our finding out about a remeasurement until long after the case was closed.

I hope that on most cases we are still calculating some statistical analyses. From the beginning of CFI these have been one of its consistent elements. In fact CFI practically grew out of the statistical approach to cruising which some of us learned 30 years ago from the old timers in statistics like S. R. Gevorkiantz and his colleagues in the experiment stations and universities throughout the country.

The few books on various types of statistical analyses have grown to a great many. Yet we still have many foresters and administrators who do not understand what the results of statistical calculations really do mean. It takes a little study of text books and a little quiet thinking to make standard errors and probabilities useful tools for reasoning out just what you really have developed in cruise or CFI figures. The only way to develop an understanding of statistics is to study and to think.



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But the formulae are not enough. There must be sound logic and careful work behind the figures that are put into the statistical formulae. The relationship between bias, accuracy and precision can be confusing. An accurate measurement is one that is just as nearly correct as you can get it with a perfectly calibrated instrument. A precise measurement made with an instrument that is not itself accurately calibrated will be biased. Bias is a one-sided, accumulatable error contained in a mis-measurement due to faulty calibration or to faulty logic. Each measurement though precisely made is a little bit off in the consistent direction of the bias.

To determine the amount of bias, one must first discover the error in his instrument's calibration or in his logic. This takes a bit of thinking. A thought about bias in categorized, remeasurement-based growth figures developed in CFI has been on the mind of Dr. Warren E. Frayer of Colorado State University, Fort Collins, Colorado.

While Mathematical Statistician at the Northeastern Forest Experiment Station, Forest Service, U. S. Department of Agriculture, Upper Darby, Pa., Dr. Frayer put this thought into the enclosed Research Note NE-60 entitled A SYSTEMATIC BIAS IN THE INTERPRETATION OF CFI RESULTS. I am pleased that he did this and hope you will be able to follow his logic.

WE WOULD LIKE TO WISH YOU ALL A VERY MERRY CHRISTMAS AND A HAPPY AND PROSPEROUS NEW YEAR.

P.S. If you are having any troubles with CFI please drop us a line, we may know someone who has the answer.

Bill Barton  
Forester